TECHNICAL REPORT 2003-015

ROVING SANDS 2003
EVENT TEST PLAN

MAY 2003

SINGLE INTEGRATED AIR PICTURE
System Engineering
Task Force (SETF)

1931 Jefferson Davis highway
Crystal Mall 3, Suite 1142
Arlington, VA 22203

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6/13/2003
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GOVERNMENT RIGHTS IN DATA STATEMENT

EXECUTIVE SUMMARY

ISSUES

Integrated Air Defense System (IADS) performance must be conducted to determine what programs need improvements. The modeling and simulation activities conducted at ROVING SANDS 2003 (RS03) event will allow the Single Integrated Air Picture System Engineering Task Force (SIAP SE TF) to investigate a set of SIAP-related issues, including TBM and translation/forwarding performance and assess the capability of the simulation units for applicability to other SIAP analysis venues.

BACKGROUND

Past Roving Sands events offered SIAP SE TF the opportunity to conduct live fly IADS performance assessments. Given that the 2003 Roving Sands event was scaled back, however, SIAP has refocused its objectives and is conducting a set of assessments using the hardware-in-the-loop (HWIL)/simulation assets available.

SCOPE

This document includes details for both the on-site (HWIL/simulation) activity and the post-event assessment efforts. It includes location of activities, who is participating in the activities, what the activities will accomplish, post-event analysis and reporting, and lessons learned processing.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDIXES

1 INTRODUCTION

1.1 Document Overview

The purpose of this document is to describe ROVING SANDS 2003 (RS03) SIAP data collection and analysis activities:

1. Document analysis goals and objectives.

2. Identify points of contact who are accountable for collection, processing, reduction, reproduction, distribution, analysis, and reporting of data.

3. Define the process and schedule for data analysis, product delivery, test observation report processing, lessons learned processing, and event reporting.

1.2 Event Overview

RS03 is a scaled-down category II Joint Interoperability exercise conducted in and around Fort Bliss, TX, the White Sands Missile Range (WSMR), NM, and distributed around the country. A Link-16 certification test will be conducted 5-16 May 2003. The actual event will be conducted 16-22 June 2003.

1.3 Background

Because the RS03 event was scaled back due to real-world events, SIAP SE TF objectives have summarily been scaled back and refocused. TBM assessments will continue as originally planned; however, the focus on the HWIL/simulation portion has changed, as will be discussed in Section 2.

1.4 Roles and Responsibilities

The roles and responsibilities of each organization are listed in the following sections. Specific points of contact are listed in Appendix D.

1.4.1 Single Integrated Air Picture System Engineer Task Force (SIAP SE TF)

The SIAP SE TF is a partner with USJFCOM for RS03 analysis efforts and is responsible for identifying objectives and data analysis requirements needed to support SIAP-related issues.

1.4.2 JITC

The Joint Interoperability Test Command will participate in the multi-TADIL translation/forwarding experiment. JITC is responsible for recording data from the Link-16 input buffer, the Link-11 output buffer, and the Master Track File. The recording of

only one "push" is needed during the May Link Certification period. However, a tertiary back-up is requested for the June SIMEX, if analysis indicates that the data collected in May has not been captured well.

1.4.3 NSWC Corona

NSWC Corona will provide the SIAP SE TF with analysis of the data from the RS03 event. Corona will compute the theater ballistic missile (TBM) SIAP attributes and report their findings. If the air breathing threat (ABT) data is available (NSWC Dahlgren and truth (ASCOT)), then NSWC Corona will also compute the SIAP ABT attributes and report their findings.

2 TEST DESCRIPTION

The section provides a complete description of the test, including the goals and objectives, those HWIL/simulations being evaluated, the on-site activity, and the post-event analysis.

2.1 SIAP RS03 Goals

The primary goals for RS03 are as follows:

1. Identify Service and Agency models capable of producing required TBM-ABT metrics parameters.

2. Generate baseline M&S assessment report for available ABT and TBM metrics (to include VV&A documentation).

2.2 SIAP RS03 Objectives

The primary objectives for RS03 are as follows:

1. Demonstrate the ability to collect HWIL/simulation data in a training environment (both in May Link-16 certification testing and June actual event).

2. Compute SIAP attributes for TBM.

3. Conduct scaled-back multi-TADIL translation/forwarding analysis.

4. Compute SIAP attributes for ABT (if data available).

2.3 SAT On-Site Activity

This section discusses the on-site activity of the SAT during the RS03 event. Because RS03 was significantly scaled back, the "fishbowl" SAT activity has been reduced to a few SAT members located at their respective HWIL/simulation nodes observing SIAP-related activity and recording test observation reports. Figure 1 shows the distributed locations of HWIL/simulation activities.

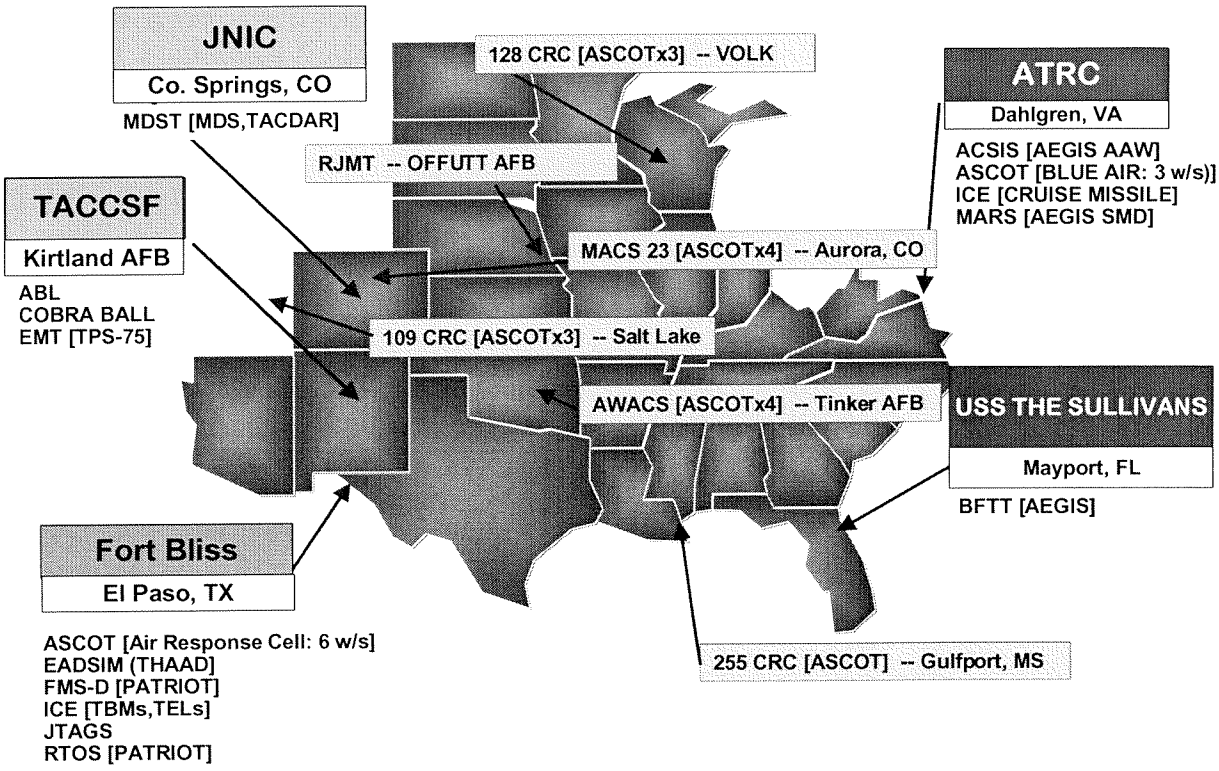

Figure 1. Participant locations for RS03

Table 1 shows the HWIL/simulations that the SIAP SE will be enlisting to meet its objectives.

Table 1. HWIL/Simulations Examined at RS03

Ref. #	C2 node represented	ABT/TBM/Both	HWIL/Sim	System	SIAP Attributes	Data Extraction	Platform location	Program Office POC	Data Collector/ Reducer
1	AEGIS USS Sullivan	TBM	MIL/HWIL	BFTT/USS Sullivan	Y, not in May	CTS	Mayport	Kim Madison	Eric Van Fleet
2	AEGIS USS Vicksburg	ABT (if available)	MIL/HWIL	ACSIS/DS3	Y, not in May	CTS	NSWC Dahlgren	Kim Madison	Eric Van Fleet
3	AEGIS BMD USS Hue City	TBM (if available)	MIL/Sim	MARS	Y, not in May	Output file	NSWC Dahlgren	Kim Madison	Eric Van Fleet
4	Truth data	ABT (if available)	Sim	ASCOT	Y	Output file	Ft. Bliss, Hurlburt, distributed locations	James Boulet	Eric Van Fleet
5	Truth data	TBM	Sim	ICE	Y	Output file	Ft. Bliss, TX	Susi Draper	Erik Van Fleet

2.3.1 Test Observation Reports

NSWC Corona will be monitoring the RS03 activity and will generate test observation reports (TORs) using the TOR form provided in Appendix C. Because RS03 is now an HWIL/simulation venue, SAT members will identify not only events of interest (EOIs) in the event proceedings such as fratricide, dual tracks, etc, but also anomalies about the HWIL/simulation they are monitoring, such as loss of connectivity. The purpose of this monitoring is for later root-cause analysis of the TBM SIAP attributes and ABT SIAP attributes if ABT data is available.

2.3.2 Root-Cause Analysis

Limited root-cause analysis in support of the IADS performance assessment will be conducted both on-site during RS03 and post-event based on the TORs generated by the NSWC Corona.

2.4 SIAP Attributes

The SIAP SE TF has developed a set of attributes derived from TAMD and CID CRD key performance parameters to evaluate IADS performance. These are described qualitatively as:

1. Completeness: The air picture is complete when all objects are detected, tracked and reported.
2. Clarity: The air picture is clear when it does not include ambiguous or spurious tracks.
3. Continuity: The air picture is continuous when the track number assigned to an object does not change.
4. Kinematic Accuracy: The air picture is kinematically accurate when the position and velocity of each assigned track agree with the position and velocity of the associated object.
5. CID Completeness: The ID is complete when all tracked objects are labeled in a state other than unknown.
6. CID Correctness: The ID is correct when all tracked objects are labeled correctly.
7. CID Clarity: The ID is clear if no tracked object is labeled with conflicting ID states.
8. Commonality: The air picture is common when the assigned tracks held by each participant have the same track number, position, and ID.

SIAP attribute measures have been created both for air objects and theater ballistic missiles. Each treatment will be addressed separately.

2.4.1 SIAP Attributes Measures for Air Vehicles

Attribute measures for air vehicles are defined in SIAP SE TF Technical Report 2001-001. It is desirable to compute the SIAP attributes for air vehicles at each event to be able to examine trends in the attributes across venues and from year to year.

Each attribute described above has a rigorously defined mathematical expression for its computation. The actual ABT SIAP attribute computations for the live portion of RS03 will be automated through the use of the Performance Evaluation Tool (PET), into which the algorithms for the SIAP attributes have been encoded. The essential data input fields required for PET evaluation of the ABT SIAP attributes are addressed in Appendix B.

Figures 2 and 3 are sample PET outputs depicting instantaneous, system-level, and roll-up measures for the ID completeness SIAP attribute.

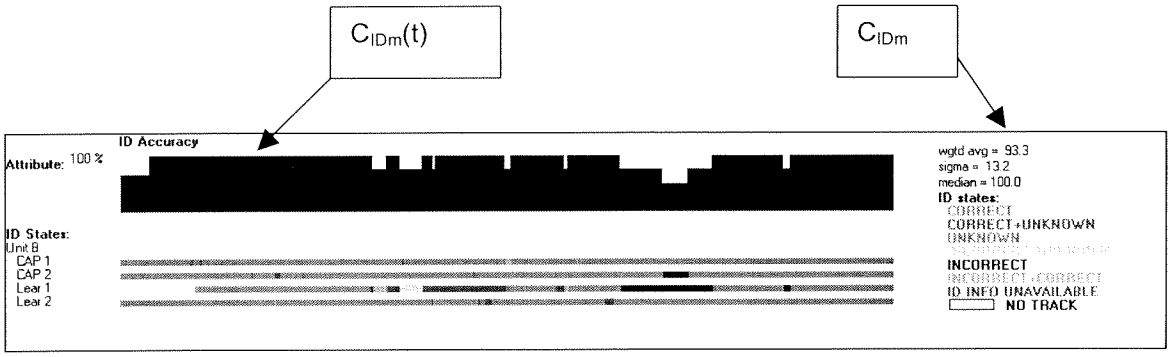

Figure 2. Instantaneous and system level SIAP attribute

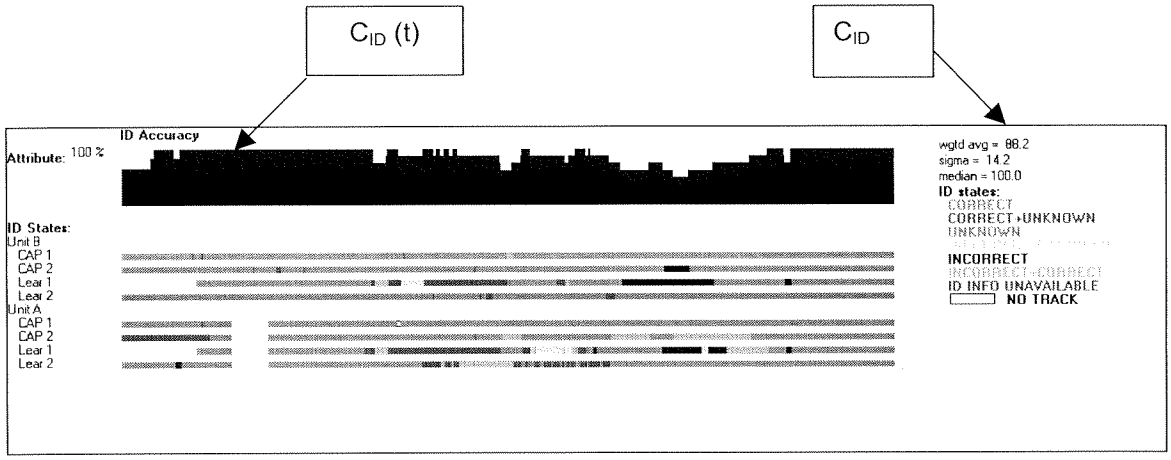

Figure 3. Roll-Up SIAP attribute

If the ABT data is available, then NSWC Corona will compute the SIAP attributes using PET and ARCTIC, a tool for automatic track-to-truth matching (see Table 2 for

computer program version numbers). Results of the truth-to-track matching will be analyzed and corrected manually, as needed.

Table 2. Computer Program Versions for SIAP Attributes Calculations

Computer Program	Function	Version	Provider
PET	SIAP Attributes Calculations		Corona
ARCTIC	Track-to-truth matching		Corona/CNA

2.4.2 SIAP Attributes Measures for Ballistic Missiles

SIAP technical report 2002-007 provides attribute measures for ballistic missiles. During RS03, analytic tools will be examined for addressing the BM SIAP attributes. A more detailed discussion of this approach will be discussed in the next section.

2.5 RS03 Assessments

2.5.1 TBM Performance Assessment

2.5.1.1 Objective

Evaluate automated analytical tools used to calculate Ballistic Missile SIAP attributes.

2.5.1.2 Sub-Objective

If the data is deemed suitable by the SAT, then calculate SIAP TBM attributes and perform root cause analysis of Ballistic Missile Events of Interest to determine whether current lack of consistency in TBM reporting criteria, data association, and correlation are adversely affecting Track Clarity and Accuracy, as defined in SIAP Technical Report 2002-007.

2.5.1.3 Hypothesis

It is hypothesized that closely spaced objects resulting from booster separation are not consistently handled by the various BMD capable systems that will result in poor correlation, the generation of dual tracks and a poor SIAP. For RS03, it will be assumed that only ballistic missile objects containing a warhead are reportable (this assumption will be recorded in subsequent events).

2.5.1.4 Measures of Performance

2.5.1.4.1 Test Methodology

Several HWIL/simulation systems will include the tracking of TBMs. Not all of these assets provide the type of data required to compute the SIAP TBM attributes. SIAP has identified what systems will participate that can meet the requirements for computing SIAP TBM attributes.

TBMs will be simulated in the Interactive Construction (ICE) model. There will be no live TBMs flown during Roving Sands 03. Some TBMs will include pre-intercept debris.

2.5.1.4.2 Analysis Team

The assessment team lead is Jeff Heckel. The points of contact named below are assisting in establishing memoranda of agreement between their program offices for acquiring HWIL/simulation data for SIAP SE:

ICE POC: Ms. Susie Draper, CAS (915) 779-6458, susi.draper@cas-west.com

AEGIS: Kim Madison, (540) 653-6745, madisonkg@nswc.navy.mil

2.5.1.4.3 Requisites

The RS03 TBM experiment requires simulated TBMs. Ideally, multiple assets should observe and report on the TBMs. However, due to the scaling back of the event, only AEGIS TBM data from several sources will be examined.

2.5.1.4.4 Data Collection Requirements

The data points for this experiment are provided below. Tailoring and augmentation may be required for each individual system.

- Data link input/output buffers
- Central Track Stores Information
- Ballistic missile classification processors
- Correlation processor
- Truth (DIS)
- Data from navigation system
- Data from sensors (radar)
- Output files (pure simulations)

Primary and secondary data collection will be conducted during the Link-16 Certification Test 5-16 May. Data will be collected during a push that is rich in TBM and ABT activity. NSWC Corona should verify that the primary and secondary data

collected is adequate for the TBM SIAP Attributes calculations. If necessary, a tertiary data collect will occur during the RS03 event itself 16-22 June 03.

2.5.1.4.5 Data Extraction Requirements

Each data collection and reduction point of contact listed in Table 1 for TBM assessment is responsible for ensuring that the data is collected properly. As needed, these points of contact will work with the program office to provide any necessary procedures to the right operators participating in RS03.

2.5.1.4.6 Data Exchange

SIAP SE TF has signed or will execute Memoranda of Agreement (MOA) with those program offices identified in Table 1 to facilitate the delivery of the HWIL/simulation data to the SIAP analysis team.

2.5.1.4.7 Data Reduction

NSWC Corona will reduce the AEGIS data and use the ICE data for truth-to-track matching and computation of the SIAP TBM attributes.

2.5.1.4.8 Success Criteria

The assessment will be considered successful if the truth data and the AEGIS data are collected and reduced for SIAP TBM attribute calculation.

2.5.1.4.9 Analysis Method

SIAP Technical Report 2002-007 lists the BM SIAP attributes and provides mathematical equations to consistently calculate the attributes. These equations will be incorporated into an automated tool, analogous to the existing Performance Evaluation Tool (PET), currently used for calculating ABT metrics. Data required to calculate the SIAP attributes will be specified and data extraction points determined for each Ballistic Missile Defense capable system participating.

TBM Analysis efforts will focus on two main goals:

1. Calculate SIAP TBM attributes.
2. Assess the suitability of the data for IADS performance assessment.

2.5.1.4.10 Expected Results

Assessment of SIAP performance of BMD capable systems will be demonstrated from several systems. The type of information expected is as follows:

1. SIAP Attributes, particularly clarity and track accuracy, based upon central track stores and "truth" as determined by the TBM objects generated in the ICE model.
2. Reporting Criteria used by each system.
3. Applicable root-cause analysis.

2.5.1.5 Reporting

NSWC Corona will calculate the SIAP TBM attributes within ninety days of the completion of the test. Corona's final report will be submitted to SIAP SE TF 30 September 2003.

2.5.2 Air Breathing Threat (ABT) M&S Assessment

2.5.2.1 Objectives

There are two objectives related to the ABT M&S assessment:

1. Collect HWIL/simulation data on ABT units and compute SIAP ABT attributes.
2. Assess the HWIL/simulation for candidacy to support JDEP.

2.5.2.2 Hypothesis

The ABT HWIL/simulation capability exhibited at RS03 may offer SIAP alternative tools for its SIAP-related analysis and in the JDEP environment.

2.5.2.3 Measures of Performance

2.5.2.3.1 Test Methodology

Table 1 lists the ABT HWIL/simulation units considered for the SIAP ABT assessment. Program offices will work with the named data collection and reduction point of contact in Table 1 to ensure the data gets to SIAP for SIAP assessment.

2.5.2.3.2 Analysis Team

The ABT assessment team lead is Jeff Heckel. NSWC Corona will conduct the ABT assessment if data is available.

2.5.2.3.3 Requisites

The RS03 ABT experiment requires simulated ABTs. Ideally, multiple assets should observe and report the ABTs on Link-16. However, due to the scale-back of the event, only AEGIS ABT data from several sources will be examined, if data is available.

2.5.2.3.4 Data Collection Requirements

The data points for this experiment are provided below. Tailoring and augmentation may be required for each individual system.

- Data link input/output buffers
- Central Track Stores Information
- Truth (DIS)
- Data from navigation system
- Data from sensors (radar)
- Output files (pure simulations)

Primary and secondary data collection will be conducted during the Link-16 Certification Test 5-16 May. Data will be collected during a push that is rich in TBM and ABT activity. NSWC Corona should verify that the primary and secondary data collected is adequate for the ABT SIAP Attributes calculations if the data will be made available for analysis. If necessary, a tertiary data collect will occur during the RS03 event itself 16-22 June 03.

2.5.2.3.5 Data Extraction Requirements

Each data collection and reduction point of contact listed in Table 1 for ABT assessment is responsible for ensuring that the data is collected properly. As needed, these points of contact will work with the program office to provide any necessary procedures to the right operators participating in RS03.

2.5.2.3.6 Data Exchange

SIAP SE TF has signed Memoranda of Agreement (MOA) with those program offices identified in Table 1 to facilitate the delivery of the HWIL/simulation data to the SIAP analysis teams.

2.5.2.3.7 Data Reduction

NSWC Corona will reduce the AEGIS data and use the ASCOT data for truth-to-track matching and computation of the SIAP ABT attributes.

The data format for the ABT assessment is that used by the performance evaluation tool (PET). The variables and formats needed for PET are provided in Appendix B. Several of the data reduction points of contact have the PET program and have the tools in place to parse the HWIL/simulation data and to calculate ABT SIAP attributes. There are some HWIL/simulations that will need additional effort to prepare the data for ABT SIAP attributes calculations.

2.5.2.3.8 Success Criteria

The assessment will be considered successful if the truth data and the AEGIS data is collected and reduced for SIAP ABT attribute calculation.

2.5.2.3.9 Analysis Method

SIAP Technical Report 2001-001 lists the ABT SIAP Attributes and provides mathematical equations to consistently calculate the attributes. These equations have been incorporated into an automated tool, the Performance Evaluation Tool (PET). Data required to calculate the SIAP attributes along with appropriate data extraction points will be specified.

ABT Analysis efforts will focus on three main goals:

1. Calculate SIAP ABT attributes.
2. Assess the suitability of the data for IADS performance assessment.
3. Assess the suitability of the HWIL/simulation for supporting JDEP.

2.5.2.3.10 Expected Results

Assessment of SIAP performance of ABT capable systems will be demonstrated if the data is available. The type of information expected is as follows:

1. SIAP ABT Attributes, particularly clarity and track accuracy, based upon central track stores and "truth" as determined by the ABT objects generated in the ASCOT model.
2. Applicable root-cause analysis.

2.5.2.4 Reporting

NSWC Corona will provide a report based on their collective efforts on the ABT assessment findings by October 30, 2003 if the ABT data is made available.

2.5.3 Multi-TADIL Translation Forwarding

2.5.3.1 Objective(s)

In cooperation with JITC, the SIAP SE will validate assessment parameters and metrics used to assess performance of Multi-TADIL Translation Forwarding systems.

In cooperation with JITC, the SIAP SE will validate data collection procedures and analysis techniques. Lessons learned will be shared between the organizations.

For those parameters collected, the SIAP SE, in cooperation with JITC will verify the correct translation of data from one TADIL to another through a system that performs translation and forwarding.

Depending upon available data, SIAP SE will validate assumptions used in the draft Functional Allocations for Multi-TADIL translation and forwarding capability being developed for the SIAP SE Reference Implementation.

2.5.3.2 Hypothesis

Correctly engineered and implemented MIL-STD-6016B translation and forwarding standards for systems that perform Multi-TADIL translation and forwarding functions will result in no undefined data conflicts between dissimilar TADIL network databases.

2.5.3.3 MOP1

Compare Link-16 input to Link-11 output of the JOCAT Air Defense Systems Integrator (ADSI) system. Verify that translation and forwarding functions do not impart unexpected error between the two Link databases.

2.5.3.3.1 Test Methodology

JITC will operate the JOCAT system that includes an ADSI. ADSI performs Multi-TADIL translation and forwarding. Due to limitations in the TADIL architecture, only TADIL J to TADIL A translation will occur with no transmission through a Link-11 terminal. Data collected will consist of data from TADIL J/Link-16 input buffers, master track files and the ADSI output of TADIL A messages in Data Extraction and Reduction Guide (DERG) format.

2.5.3.3.2 Analysis Team

The JITC JOCAT system team lead is Mr. Tom Cole. SIAP SE Task Force will be represented on site by Mr. Jason Long, (540) 658-1215 x1003, email: jason.long@RNBTechnologies.com. The SIAP SE POC for Multi-TADIL Translation and Forwarding Critical Experiment is Mr. Jerry Darnell. (703) 602-6441 x223, email: darnelljm@navsea.navy.mil

2.5.3.3.3 Requisites

Due to the limited RS03 Link Architecture, the SIAP SE experiment for Multi-TADIL translation and forwarding will be a passive collection of data from a single

system that is performing the translation and forwarding function. No requisite scenario or other support will be required.

2.5.3.3.4 Data Requirements

Data from Link-16 input buffer, the Link-11 output buffer and the Master Track File will be recorded during RS03 scenario runs. Candidate messages for conversion analysis from Link-16 to Link-11 are J2.2, J2.5, J3.2, J3.6 and J7.0. Data needs include the collection of a vulnerability period or "push" to observe the Link reporting and translation/forwarding of both air breathing and ballistic missile tracks. The recording of only one "push" is needed during the May Link Certification period. However, SIAP SE requests verification of data between events with selection of a back-up collection time (an additional "push") if needed. A tertiary back-up is requested for the June SIMEX if analysis indicates that the data collected in May has not been captured well.

2.5.3.3.5 Success Criteria

In this exploratory experiment, the important objectives are to refine the test process, metrics, and analysis tools for assessing Multi-TADIL translation and forwarding. From the data collected, validate test assumptions and verify that the data collected will support analysis of MIL-STD-6016B compliance.

2.5.3.3.6 Analysis Method

Mr. Jerry Darnell will lead an analysis team to look at the Link data. Preliminary planning includes the following for each message type to be analyzed:

- Extract several messages of the same type
- Extract the fields of each these messages
- Compare the fields prior to translation or forwarding (the Link-16 data) to the fields output as a result of the translation or forwarding (the Link-11 data).
- The comparison should include a verification that the fields are the same. There will be cases where error has been introduced due to the resolution of data fields between the two data links. These differences should be noted.

The time latency of the end-to-end process should be analyzed for each message. This will show if data is being dumped or if stale (old) data is being put on the link degrading the information presented to a user.

2.5.3.3.7 Expected Results

Due to the limited scope of data collection, this effort is primarily designed to validate SIAP SE test procedures for translation and forwarding and to establish a baseline for later ADSI assessment when ADSI Version 12 will be presented to JITC for translation and forwarding Link Certification.

2.5.3.4 Reporting

General reporting guidance is as follows: One week after the exercise – a quick look or trip report presentation to the T/F Working Group will be done. An analysis report will be required within two months after completion of exercise. A final report will be due within three months after test completion and will include analysis results and an indication of the success of developing appropriate collection and analysis methods. The report should also include lessons learned to be implemented prior to future ADSI Multi-Link translation and forwarding assessments.

3 REPORTING

3.1 Technical Reports

As discussed in Section 2, there will be reports generated, each summarizing findings from each of the individual assessments. Table 3 gives an outline of the standard technical report.

Table 3. Standard Results Technical Report Outline

EXECUTIVE SUMMARY
INTRODUCTION
- Purpose
- Background
- Overall Test Objectives
- Test Item Description
- Instrumentation
- Participating Organizations and Elements
- Assessment Constraints and Limitations

ASSESSMENT RESULTS
- General
- Objectives
- Listing of each objective, test procedures, criteria, and corresponding results and discussion

LESSONS LEARNED
UNRESOLVED ISSUES
CONCLUSIONS AND RECOMMENDATIONS
REFERENCES
APPENDICES: ACRONYMS, DETAILED DESCRIPTIONS OF TEST, INSTRUMENTATION, EXTENSIVE DATA (TABLES), MATHEMATICAL ANALYSIS

3.2 Lessons Learned

Each assessment team will generate lessons learned from the RS03 event. These lessons will include issues with logistics, planning, execution, and analysis.

3.3 Unresolved Issues

Any unresolved issues will be documented and included in the appropriate reports.

4 REFERENCES

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SIAP SE TF Technical Report 2002-007: Ballistic Missile Single Integrated Air Picture Attributes. (2002, November). Arlington, VA: SIAP SE TF.

SIAP SE TF Technical Report 2003-006: Single Integrated Air Picture (SIAP) Verification, Validation, and Accreditation Guide for Models and Simulations. (2003, February). Arlington, VA: SIAP SE TF.

APPENDIX A: Acronyms

ABT	Air Breathing Threat
ADSI	Air Defense System Integrator
AF	Air Force
AFB	Air Force Base
AWACS	Airborne Warning and Control System
CAOC	Combined Air Operations Center
CID	Combat identification
CJCSM	Chairman of the Joint Chiefs of Staff Manual
CM	Cruise Missile
CTS	Central Track Stores
DISA	Defense Information Systems Agency
DMAP	Data Management and Analysis Plan
DOT&E	Director, Operational Test and Evaluation
DSN	Defense Switched Network
ECM	Electronic Countermeasures
EOI	Event of Interest
EW	Electronic Warfare
FAR	Final Analysis Report
GMT	Greenwich Mean Time
HLA	High Level Architecture
IADS	Integrated Air Defense System
ID	Identification
IFF/SI	Identification Friend or Foe
JDEP	Joint Distributed Engineering Plant
JDN	Joint Data Network
JICO	Joint Interface Control Officer
JITC	Joint Interoperability Test Command
JMTOP	Joint Multi-Tactical Digital Information Link Operation Procedures (CJCSM 6120.01B)
JOCAT	Joint Operational C4I Assessment Team
LMS-16	Link Monitoring System-16
LOB	Line of Bearing
MIL-STD	Military Standard

MIL	Military
NACTS	Nellis Air Combat Training System
OPFOR	Opposing Forces
POC	Point of Contact
PPLI	Precise Participant Location and Identification
RF	Radio Frequency
RS03	ROVING SANDS 03
SE	System Engineer
SIAP	Single Integrated Air Picture
SIPRNET	SECRET Internet Protocol Router Network
TBM	Theater Ballistic Missile
TDDS	TRAP Data Dissemination System
TDIMF	Tactical Data Intercomputer Message Format
T/F	Translation/Forwarding
TIAC	TMD Interoperability Assessment Capability
TIBS	Tactical information Broadcast Service
TMD	Theater Missile Defense
TOR	Test Observation Report
TRAP	Tactical Receive Equipment and Related Applications
TSPI	Time Space Position Indicator
USJFCOM	United States Joint Forces Command

APPENDIX B: Data Management

This appendix provides information about data storage and lists data formats for the RS03 event.

Data Archival and Storage

NSWC Corona will perform its own data archival. Data from RS03 shall be stored for a period of five years following the event.

PET FORMAT

Table B-1 provides the data format for the performance evaluation tool for computing the ABT SIAP attributes.

Table B-1 PET Input Requirements (WAM Format)

Field #	VARIABLE	DEFINITION	Required for Attributes	Notes
1	**RECTYPE**	**Record Type** - Code which defines the format of the following record. This will always be **1** for the record defined in this table. 1 = Air track record 2 = Ballistic missile track record 3 = Launch Point Estimate and Impact Point Prediction record	Y	
2	**SYS**	**System Variant** 0 = Truth, TSPI 1 = AEGIS BL 2.10 2 = AEGIS BL 5.0 3 = AEGIS BL 5.C 4 = AEGIS BL 5.7 5 = AEGIS BL 6.1 20 = Patriot ICC 21 = Patriot ECS 22 = Patriot System 30 = AWACS 40 = E-2C 50 = ACDS BLK 0 51 = ACDS BLK 1		
3	**CONV**	**Convention** - This field is used to specify which coordinate system is represented by the data in fields 8-19.	Y	

Field #	VARIABLE	DEFINITION	Required for Attributes	Notes
		2 = REFLLA - Track X Y Z position and velocity (Fields 8-13) are unit-centered, LAT LON ALT (Fields 14-16) are location of unit. (PET converts to WGS 84 track location) 3 = TRUE - Track X Y Z position and velocity (Fields 8-13) are not used, LAT LON ALT (Fields 14-16) are WGS-84 track location, and CRS SPD CLM (Fields 17-19) are track kinematics. 4 = ECEF - Track X Y Z position and velocity (Fields 8-13) are ECEF coordinates, PET calculates LAT LON ALT (Fields 14-16) WGS-84 track location.		
4	**TN**	**Track Number** - This is the number used to identify tracks in the combat system's database AEGIS = CTSL E-2C = ACN Patriot = Sequence Number + TDR	Y	
5	**LTN**	**Link Track Number**	Y	
6	**XTIME**	**Extract Time** in seconds past GMT midnight	Y	
7	**DVALTIME**	**Data Valid Time** in seconds past GMT midnight	Y	
8	**X**	**Track X Y Z Position** in meters The definitions of these fields are dependent on what is in field 3 (Convention) Convention = 2 - Track position in respect to reference unit Convention = 3 - N/A Convention = 4 - Track position in respect to earth center	Y*	
9	**Y**		Y*	
10	**Z**		Y*	
11	**XVEL**	**Track X Y Z Velocity** in meters/second The definitions of these fields are	Y*	

Field #	VARIABLE	DEFINITION	Required for Attributes	Notes
		dependent on what is in field 3 (Convention) Convention = 2 - Track velocity in respect to reference unit Convention = 3 - N/A Convention = 4 - Track velocity in respect to earth center		
12	**YVEL**		Y*	
13	**ZVEL**		Y*	
14	**LAT**	**Latitude Longitude** in degrees Positive for East/North - Negative for West/South Format: +/- DDD.ddddd The definitions of these fields are dependent on what is in field 3 (Convention) Convention = 2 - Unit position (PATRIOT ICC this is SCC) (E-2C this is STRP) Convention = 3 - Track position Convention = 4 - N/A	Y*	
15	**LONG**		Y*	
16	**ALT**	**Altitude** in feet The definitions of these fields are dependent on what is in field 3 (Convention) Convention = 2 - Unit altitude (PATRIOT ICC this is SCC = 0) Convention = 3 - Track altitude Convention = 4 - N/A	Y*	
17	**CRS**	**Course** in degrees with respect to true north The definitions of these fields are dependent on what is in field 3 (Convention) Convention = 2 - Unit cource Convention = 3 - Track cource Convention = 4 - N/A	Y*	
18	**SPD**	**Speed** in data miles per hour (6000ft/hr) The definitions of these fields are	Y*	

Field #	VARIABLE	DEFINITION	Required for Attributes	Notes
		dependent on what is in field 3 (Convention) Convention = 2 - Unit speed Convention = 3 - Track speed Convention = 4 - N/A		
19	**CLM**	**Climb Angle** in degrees with respect to the horizon plain The definitions of these fields are dependent on what is in field 3 (Convention) Convention = 2 - Unit climb angle Convention = 3 - Track climb angle Convention = 4 - N/A	Y*	
20	**CAT**	**Category** 0 = Undefined 1 = Air 2 = Surface 3 = Subsurface 4 = Land 5 = Space	Y	
21	**ID**	**Identification** 0 = Pending 1 = Unknown 2 = Assumed Friend 3 = Friend 4 = Neutral 5 = Suspect 6 = Hostile 7 = True Friend (mode IV Friend) 8 = Special Friend (PPLI Friend) 9 = Undefined	Y	
22	**LTQ**	**Local Track Quality** (Patriot ICC this is ETQ) 0-15 = 0-15	Y	
23	**RTQ**	**Remote Track Quality** 0-15 = 0-15	Y	
24	**MUTRK**	**Mutual Track Indicator** 0 = Not Mutual 1 = Mutual	Y	
25	**LR**	**Local or Remote** 0 = Local 1 = Remote	Y	

Field #	VARIABLE	DEFINITION	Required for Attributes	Notes
26	**RU**	**Reporting Unit** - The LTN of the unit reporting this track (Link Source Track Number /JU Number)		
27	**RRI**	**Reporting Responsibility Indicator** 0 = Unit does not have R2 1 = Unit does have R2, track is being reported		
28	**M1**	**Mode I** - Octal value 00 – 73		
29	**M2**	**Mode II** - Octal value 00 – 7777		
30	**M3**	**Mode III** - Octal value 00 – 7777		
31	**M4**	**Mode IV** 0 = Not Interrogated/No statement 1 = Interrogated, No response 2 = Interrogated, Invalid response 3 = Interrogated, Valid response		
32	**DI**	**DI Code**		
33	**SIZE**	**Size/Strength** 0-15 for Link-16 methodology 0-101 for Rivit Joint	Y	
34	**TRKST**	**Track Status** 0 = Tentative 1 = Firm 2 = Provisional 3 = False track		
35	**TT**	**Addition track information** **AEGIS** **Trouble track** 0 = Not a trouble track 1 = Trouble track **PATRIOT ICC** **Slow track** 0 = Track is not below the speed threshold		

Field #	VARIABLE	DEFINITION	Required for Attributes	Notes
		1 = Track is below the speed threshold E-2C **Miss Count** miss count indecator from 0 to 31		
36	**DROPTRK**	**Drop Track Indicator** 0 = track not dropped 1 = track is dropped (this is last data point for this track number)		
37	**IDCONF**	**ID Conflict** 0 = No conflict 1 = There is an ID conflict on this track		
38	**ENG**	**Engagement flag** 0 = Not engaged 1 = Engaged		
39	**ENGSTAT**	**Local engagement status** 0 = No statement 1 = Recommend reattack 2 = Weapon assigned 3 = Tracking 4 = Firing 5 = Target Destroyed 6 = Partially Effective 7 = Not Effective 8 = Engagement Broken 9 = Heads up 10 = Engagement Interrupted 11 = Investigating/Interrogating 12 = Shadowing 13 = Intervening 14 = Covering 15 = BDA unknown		
40	**RENG**	**Remote engagement status** 0 = No statement 1 = Recommend reattack 2 = Weapon assigned 3 = Tracking 4 = Firing 5 = Target Destroyed 6 = Partially Effective 7 = Not Effective 8 = Engagement Broken 9 = Heads up 10 = Engagement Interrupted 11 =		

Field #	VARIABLE	DEFINITION	Required for Attributes	Notes
		Investigating/Interrogating 12 = Shadowing 13 = Intervening 14 = Covering 15 = BDA unknown		
41	**TRKSRC**	**Track Source** **AEGIS** / **PATRIOT ICC** 0 = Source N/A / 0 = FP1 1 = SPY / 1 = FP2 2 = SPS 49 / 2 = FP3 3 = ADT 55 / 3 = FP4 4 = IFF / 4 = FP5 5 = LYA / 5 = FP6 6 = Manual / 6 = FP7 7 = PAT 2 / 7 = FP8 8 = SPQ-9 / 8 = FP9 9 = Remote / 9 = FP10 10 = ASWCS / 10 = FP11 11 = LAMPS / 11 = FP12 12 = SPS-67 / 12 = BNA 13 = L16 DownLink / 13 = BNB 14 = CEP-A / 14 = BNC 15 = CAP-B / 15 = BND 16 = BNE 17 = BNF 18 = HEU 19 =AUX1 20 =AUX2 21 = AUX3		
42	**RTRKSRC**	**Remote Track Source** 0 = Link-11 1 = Link-16 2 = TIBS 3 = TADIL B 4 = CEC 5 = Link-16 2nd Net		
43	**IDSRC**	**ID Source** **AEGIS** / **PATRIOT ICC** 0 = None / 0 = None 1 = Manual / 1 = N/A 2 = Link-16 DownLink / 2 = Operator 3 = Mode IV / 3 = PAM 4 = SLQ-32 / 4 = AUTO 5 = Link / 100 = FP1 6 = Link 4A / 101 = FP2 7 = ASWCS / 102 = FP3 8 = LAMPS / 103 = FP4 9 = Auto / 104 = FP5 10 = Correlation / 105 = FP6 11 = CEP / 106 = FP7		

Field #	VARIABLE	DEFINITION	Required for Attributes	Notes
		12 = CECU 107 = FP8 108 = FP9 109 = FP10 110 = FP11 111 = FP12 112 = BNA 113 = BNB 114 = BNC 115 = BND 116 = BNE 117 = BNF 118 = HEU 119 = AUX1 120 = AUX2 121 = AUX3		
44	**HGTSRC**	**Height Source** 0 = No Statement/estimated 1 = Sensor 2 = Manual aircraft report 3 = Automatic aircraft report		
45	**M1SRC**	**Mode I Source** 0 = Information Unavailable 1 = UPX 29 2 = Link 3 = Manual 4 = CEC 5 = CCU 6 = Link-16 PPLI		
46	**M2SRC**	**Mode II Source** 0 = Information Unavailable 1 = UPX 29 2 = Link 3 = Manual 4 = CEC 5 = CCU 6 = Link-16 PPLI		
47	**M3SRC**	**Mode III Source** 0 = Information Unavailable 1 = UPX 29 2 = Link 3 = Manual 4 = CEC 5 = CCU 6 = Link-16 PPLI		

Field #	VARIABLE	DEFINITION	Required for Attributes	Notes
48	**M4SRC**	**Mode IV Source** 0 = Information Unavailable 1 = UPX 29 2 = Link 3 = Manual 4 = CEC 5 = CCU 6 = Link-16 PPLI		
49	**CLASS**	**Classification of the track** **PATRIOT ICC** 0 = No Statement 10 = ABT 11 = ABT Nominal 12 = ABT Rpv Uav 13 = ABT Cruise Missile 14 = ABT Arm Carrier 15 = ABT Manned 16 = ABT Unmanned 20 = TBM 21 = TBM A 22 = TBM B 23 = TBM C 24 = TBM D 25 = TBM E 30 = ASM 31 = ASM Nominal 32 = ARM A 33 = ARM B 34 = ARM C 35 = ARM D 40 = SAM 41 = SAM Patriot 42 = SAM Hawk 43 = SAM Thaad 44 = SAM Other		
50	**PLAT**	**Platform** Bit code as reported in the J3.2C1 message		
51	**ACT**	**Activity** Bit code as reported in the J3.2C1 message		
52	**SPECTYP**	**Specific type** Bit code as reported in the J3.2C1 message		
53	**TN1**	**Additional track number 1** AEGIS = CGTN Patriot ICC = CTDR of pri source		

Field #	VARIABLE	DEFINITION	Required for Attributes	Notes
54	**TN2**	**Additional track number 2** CEC Units = CEPN Patriot ICC = FP 1 CTDR		
55	**TN3**	**Additional track number 3** CEC Units = CECUID Patriot ICC = FP 2 CTDR		
56	**TN4**	**Additional track number 4** Patriot ICC = FP 3 CTDR		
57	**TN5**	**Additional track number 5** Patriot ICC = FP 4 CTDR		
58	**TN6**	**Additional track number 6** Patriot ICC = FP 5 CTDR		
59	**TN7**	**Additional track number 7** Patriot ICC = FP 6 CTDR		

Table B-2. PET ABT Format (WAM)

Field #	Variable in track_st	Field Size	Required or Optional	Definition	Notes
1	keyword	5 A	Required	Must be: TRACK	
2	source	3 A	Required	Data source of track Example: MAH = USS MAHAN PAT = Patriot TAO = TAOM TRU is reserved for "truth" or "TSPI" tracks. Note that the WAM track identifier is: SOURCE concatenated with UNIT_DES that is ten characters (3 + 7 = 10).	1
3	unit_des	7 A	Required	Designator used to describe unit (e.g. STN, JTN, CTSL) Example: 1283	1
4	unit_name	20 A	Optional	Unit name	1

				Example: ABRAHAM LINCOLN HMS WARRIOR P-3C MT131 LINCOLN F-14D 101	
5	unit_no	7 A	Optional	Unit Number Example: CV-66 (Hull Number) 402 (Side Number) MT131 (Event Number)	1
6	unit_type	10 A	Required for truth	Unit Type Determines the silhouette symbol displayed in Replay and Tracks when the Silhouette Symbols option is chosen. Example: F-14 LEAR CG	1
7	expend_des	7 A	Optional	Seven letter unit designator (UNIT_DES) of unit expending sonobuoy, weapon, or other expendables.	
8	mission	10 A	Optional	Mission Example: CAP CAS SUCAP STK CNTRL	
9	cvw_evt	5 A	Optional	Carrier Event Number Example: 2B1 14A2	
10	sta_assign	20 A	Optional	Station Assigned Example: 13C 1845N-06543W FOXTROT	
11	exercise	20 A	Optional	Exercise name Example: JTFX97-1 JCIET 98	

				JCIET 2000	
12	raid	10 A	Optional	Raid name/number Example: Event 2	
13	constr_lo	7 A	Optional	Constructive loadout Example: 2-2-2	
14	country	10 A	Optional	Unit country name Example: USA	
15	cor_trk_des	7 A	Optional	Unit designator (UNIT_DES) of unit the track correlates to.	
16	trk_sim	15 A	Optional	Simulation This field is freeform and is used when a real world unit (aircraft, ship, sub, tank, etc.) is simulating another type of unit. Examples: Mirage Exocet Silkworm Kirov	
17	disp_color	2 N	Optional	Track Display Color If this field is blank, the track will be displayed using default colors (Blue = Friend, Red = Hostile, etc.). 0 – 39 = Track will be displayed using the corresponding color as defined in the Set Colors Window of WAM. Must be: 0 – 39	

18	tru_trk	1 A	Optional	Truth Track Indicator Y = Truth Track N or blank = Not Truth Track If this field is Y, the track will be treated as though it had a Source of TRU.	
19	taxonomy	10 A	Optional	Indicates ID taxonomy and fields (in the point record) to use. All taxonomies will use field 20 (ID) . LINK11 = LINK-11, TADIL A, B, C taxonomy. Will use fields 21 and 22. LINK16 = LINK16, JTIDS, TADIL J taxonomy. Will use fields 54,55,56, and 22 The status box will change based on this field to correctly describe the data displayed	
20	turreted	1 A	Optional	Turreted Vehicle Indicator Y = Turreted N or blank = Not Turreted	2

Ballistic Missile Data Format

The data format for computing the attributes for ballistic missiles is provided in Table B-3.

Table B-3 Ballistic Missile Track Record

File Name: May be customized for each venue
Line 1 (required): Venue/event and unit name from which data is extracted (example: RS03_BMD_Event1, PAC_ICC#2)
Line 2 (required): Number of lines N of optional static header information
Lines 3 through N+2 (optional): Static header information in unspecified format.
Line N+3: Start format below

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
1	Record_Type	1 A	Required	Code indicating record type: 1 = Air track or air vehicle truth object data 2 = BM track or BM truth object data 3 = BM LPE or IPP or truth launch or impact data 0 and 4 - 9 Reserved A - Z = Custom record type whose format, content, and meaning is somehow indicated on lines 3 through N+2.		
2	Intended_Treatment	1 N	Required	Code for how the record is to be treated: 0 = Record is truth data 1 = Record is track data to be scored in metrics 2 = Record is other track data (for root cause analysis)		
3	Trk_Number	18 A	Required	Alpha-numeric string that by itself or in concatenation with file Line 1 uniquely names this track or truth object at the indicated valid time and that is intended to be kept throughout the perceived track lifetime. Examples: CTSL1003, L16#0A001, n0001t401056c002	J3.6I Track Number, Reference	1
4	Net_Source	5 A	Required	Network source of kinematic track Examples: LOCAL, L16, TIBS, CEC, TRUTH		1
5	Trk_Source	8 A	Required	Alpha-numeric string that by itself or in concatenation with the Net_Source data item value uniquely names the source for this track. If this track is a remote track, enter the network interface unit (track) number of the source of the track data. If this track is not remote,		1

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
				enter a string for the (primary) local sensor source for this track. Examples: L16#00076, LOC_59, CEC_SPY, LOC_FU1,		
6	Time_Ref	7 A	Required	Time reference for the Time_Date, Time_Hrs&Min, and Time_Sec data item values in this record Examples: UTC, GPS, L16_NTR		
7	Time_Date	8 N	Required	Zulu date part of valid time for the data in this record. Format: YYYYMMDD YYYY = Year, MM = Month, DD = Day Example: 20030326 = March 26, 2003 Must be 8 digits		
8	Time_Hrs&Min	4 N	Required	Zulu hours and minutes part of valid time for the data in this record Format: HHMM HH = Hours, MM = Minutes Example: 1754 Must be 4 digits	J3.6I Minute for MM portion	
9	Time_Sec	11 N	Required	Seconds part of valid time for the data in this record. Format: 39.57213501 Truth data should have one 10 nanosecond precision. Track data should have maximum available precision down to 10 nanosecond		
10	Trk_Status	1 N	Required	Track status: 0 = Unknown 1 = Tentative track 2 = New firm track 3 = Updated firm track 4 = Coasted track, not lost 5 = Coasted track, lost 9 = No statement		1
11	Identity	1 N	Required	Identification 0 = Pending 1 = Unknown 2 = Assumed Friend 3 = Friend 4 = Neutral 5 = Suspect 6 = Hostile 7 = Undefined	J3.6I Identity	1
12	Boost_Indicator	1 N	Required	Flag to indicate boost phase 0 = Post boost phase 1 = Boost phase 9 = No statement	J3.6E1 Boost Indicator	1
13	Trk_Aggregation	1 N	Required	Type of (perceived) aggregation of the data from which the track is generated: 0 = Unknown		1

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
				1 = Resolved single object track 2 = Unresolved closely spaced object (UCSO) track 3 = Intentionally blended track 4 = Cluster centroid track 5 = Cluster selected object track		
14	Trk_Strength	4 N	Required	Tactical data system's perception of the integer number of separated objects constituting this track. 0 = Unknown 1 through 9998 for estimate 9999 = No statement If this track is perceived to be a UCSO track, the estimate entered for this data item could be based on signal processing, remote data, and/or *a priori* information. If this track is a blended track or a cluster centroid track perceived to be on resolved objects, the estimate should be the number of discrete object tracks that are blended or known to be contained in the cluster, respectively. If this track is a blended track or a cluster centroid track perceived to be on a combination of resolved objects and UCSOs, the estimate should be an appropriately combined estimate.		1
15	Track_Quality	2 N	Required	Track quality. Computed the same as for J3.6. 0 = Non-real time 1 through 15, per J3.6 IAW MIL-STD-6016B 99 = No statement	J3.6I Track Quality	1
16	Vel_wt_for_TQ	6 N	Required	Value of the initialization parameter DeltaT in the DeltaT^2 weight of the sum of velocity variances in the calculation of J3.6 track quality, in units of seconds. Format: 6.000 This is needed when components of track error covariance are not given and need to be imputed from Track_Quality.		
17	Px	15 N	Required	X position, in WGS-84 earth-centered, earth fixed (ECEF) Cartesian coordinates, in meters. Format: -6378521.56372 For truth tracks, maximum precision is desired	J3.6E0 X Position	1
18	Py	15 N	Required	Y position, in WGS-84 ECEF Cartesian coordinates, in meters. Format: same as Px	J3.6E0 Y Position	1
19	Pz	15 N	Required	Z position, in WGS-84 ECEF Cartesian coordinates, in	J3.6E1	1

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
				meters. Format: same as Px	Z Position	
20	Vx	11 N	Required	X velocity, in WGS-84 ECEF Cartesian coordinates, in meters per second. Format: -2963.01567 For truth tracks, maximum precision is desired	J3.6E0 X Velocity	1
21	Vy	11 N	Required	Y velocity, in WGS-84 ECEF Cartesian coordinates, in meters per second. Format: same as Vx	J3.6E1 X Velocity	1
22	Vz	11 N	Required	Z velocity, in WGS-84 earth-centered, earth fixed (ECEF) Cartesian coordinates, in meters per second. Format: same as Vx	J3.6E1 X Velocity	1
23	Ax	10 N	Required for truth tracks	X acceleration, in WGS-84 ECEF Cartesian coordinates, in meters per second squared. Format: -102.36428 9999.99999 for no statement		
24	Ay	10 N	Required for truth tracks	Y acceleration, in WGS-84 ECEF Cartesian coordinates, in meters per second squared. Format: same format as Ax		
25	Az	10 N	Required for truth tracks	Z acceleration, in WGS-84 ECEF Cartesian coordinates, in meters per second squared. Format: same format as Ax		
26	SigmaT	9 N	Required	Standard deviation or RMS error of the Time_Sec data item value for this record, in units of seconds. Format: 12.0679834 (more typically, 0.0003)		
27	SigmaPx	11 N	Required if available	Square root of the error covariance matrix element for variance of Px, denoted $_{Px}$, in WGS-84 ECEF Cartesian coordinates, in meters. Format: 10659.30241 -9999.99999 for no statement If the code for no statement is entered, a rough estimate value of SigmaPx may be imputed from Track_Quality.	J3.6C1 Sigma X Position	
28	SigmaPy	11 N	Required if available	Square root of the error covariance matrix element for variance of Py, denoted $_{Py}$, in WGS-84 ECEF Cartesian coordinates, in meters. Format: same format as SigmaPx If the code for no statement is entered, a rough estimate value of SigmaPy may be imputed from Track_Quality.	J3.6C1 Sigma Y Position	
29	SigmaPz	11 N	Required	Square root of the error covariance matrix element for	J3.6C1	

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
			if available	variance of Pz, denoted $_{Pz}$, in WGS-84 ECEF Cartesian coordinates, in meters. Format: same format as SigmaPx If the code for no statement is entered, a rough estimate value of SigmaPz may be imputed from Track_Quality.	Sigma Z Position	
30	SigmaVx	11 N	Required if available	Square root of the error covariance matrix element for variance of Vx, denoted $_{Vx}$, in WGS-84 ECEF Cartesian coordinates, in meters per second. Format: 468.23792 -9999.99999 for no statement If the code for no statement is entered, a rough estimate value of SigmaVx may be imputed from Track_Quality.	J3.6C2 Sigma X Velocity	
31	SigmaVy	11 N	Required if available	Square root of the error covariance matrix element for variance of Vy, denoted $_{Vy}$, in WGS-84 ECEF Cartesian coordinates, in meters per second. Format: same format as SigmaVx If the code for no statement is entered, a rough estimate value of SigmaVy may be imputed from Track_Quality.	J3.6C2 Sigma Y Velocity	
32	SigmaVz	11 N	Required if available	Square root of the error covariance matrix element for variance of Vz, denoted $_{Vz}$, in WGS-84 ECEF Cartesian coordinates, in meters per second. Format: same format as SigmaVx If the code for no statement is entered, a rough estimate value of SigmaVz may be imputed from Track_Quality.	J3.6C2 Sigma Z Velocity	
33	CorPxVx	12 N	Required if available	Correlation of X position and X velocity, calculated as unitless Cov(Px,Vx)/($_{Px}$ $_{Vx}$), where Cov(Px,Vx) is the error covariance matrix element for covariance of X position with X velocity, $_{Px}$ is SigmaPx, and $_{Vx}$ is SigmaVx, in ECEF Cartesian coordinates. Format: -0.653200616 If the code for no statement is entered, a rough estimate value of CorPxVx may be imputed from a thumb rule.		
34	CorPyVy	12 N	Required if available	Correlation of Y position and Y velocity, calculated as unitless Cov(Py,Vy)/($_{Py}$ $_{Vy}$), where Cov(Py,Vy) is the error covariance matrix element for covariance of Y position with Y velocity, $_{Py}$ is SigmaPy, and $_{Vy}$ is SigmaVy, in ECEF Cartesian coordinates.		

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
				Format: same as CorPxVx If the code for no statement is entered, a rough estimate value of CorPyVy may be imputed from a thumb rule.		
35	CorPzVz	12 N	Required if available	Correlation of Z position and Z velocity, calculated as unitless Cov(Pz,Vz)/($_{Pz}$ $_{Vz}$), where Cov(Pz,Vz) is the error covariance matrix element for covariance of Z position with Z velocity, $_{Pz}$ is SigmaPz, and $_{Vz}$ is SigmaVz, in ECEF Cartesian coordinates. Format: same as CorPxVx If the code for no statement is entered, a rough estimate value of CorPzVz may be imputed from a thumb rule.		
36	CorPxPy	12 N	Required if available	Correlation of X position and Y position, calculated as unitless Cov(Px,Py)/($_{Px}$ $_{Py}$), where Cov(Px,Py) is the error covariance matrix element for covariance of X position with Y position, $_{Px}$ is SigmaPx, and $_{Py}$ is SigmaPy, in ECEF Cartesian coordinates. Format: same as CorPxVx If the code for no statement is entered, CorPxPy = 0.0 will be assumed.		
37	CorPxPz	12 N	Required if available	Correlation of X position and Z position, calculated as unitless Cov(Px,Pz)/($_{Px}$ $_{Pz}$), where Cov(Px,Pz) is the error covariance matrix element for covariance of X position with Z position, $_{Px}$ is SigmaPx, and $_{Pz}$ is SigmaPz, in ECEF Cartesian coordinates. Format: same as CorPxVx If the code for no statement is entered, CorPxPz = 0.0 will be assumed.		
38	CorPyPz	12 N	Required if available	Correlation of Y position and Z position, calculated as unitless Cov(Py,Pz)/($_{Py}$ $_{Pz}$), where Cov(Py,Pz) is the error covariance matrix element for covariance of Y position with Z position, $_{Py}$ is SigmaPy, and $_{Pz}$ is SigmaPz, in ECEF Cartesian coordinates. Format: same as CorPxVx If the code for no statement is entered, CorPyPz = 0.0 will be assumed.		
39	CorVxVy	12 N	Required if available	Correlation of X velocity and Y velocity, calculated as unitless Cov(Vx,Vy)/($_{Vx}$ $_{Vy}$), where Cov(Vx,Vy) is the error covariance matrix element for covariance of X velocity with Y velocity, $_{Vx}$ is SigmaVx, and $_{Vy}$ is SigmaVy, in ECEF Cartesian coordinates.		

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
				Format: same as CorPxVx If the code for no statement is entered, CorVxVy = 0.0 will be assumed.		
40	CorVxVz	12 N	Required if available	Correlation of X velocity and Z velocity, calculated as unitless Cov(Vx,Vz)/($_{Vx}$ $_{Vz}$), where Cov(Vx,Vz) is the error covariance matrix element for covariance of X velocity with Z velocity, $_{Vx}$ is SigmaVx, and $_{Vz}$ is SigmaVz, in ECEF Cartesian coordinates. Format: same as CorPxVx If the code for no statement is entered, CorVxVz = 0.0 will be assumed.		
41	CorVyVz	12 N	Required if available	Correlation of Y velocity and Z velocity, calculated as unitless Cov(Vy,Vz)/($_{Vy}$ $_{Vz}$), where Cov(Vy,Vz) is the error covariance matrix element for covariance of Y velocity with Z velocity, $_{Vy}$ is SigmaVy, and $_{Vz}$ is SigmaVz, in ECEF Cartesian coordinates. Format: same as CorPxVx If the code for no statement is entered, CorVyVz = 0.0 will be assumed.		
42	CorPxVy	12 N	Required if available	Correlation of X position and Y velocity, calculated as unitless Cov(Px,Vy)/($_{Px}$ $_{Vy}$), where Cov(Px,Vy) is the error covariance matrix element for covariance of X position with Y velocity, $_{Px}$ is SigmaPx, and $_{Vy}$ is SigmaVy, in ECEF Cartesian coordinates. Format: same as CorPxVx If the code for no statement is entered, CorPxVy = 0.0 will be assumed.		
43	CorPxVz	12 N	Required if available	Correlation of X position and Z velocity, calculated as unitless Cov(Px,Vz)/($_{Px}$ $_{Vz}$), where Cov(Px,Vz) is the error covariance matrix element for covariance of X position with Z velocity, $_{Px}$ is SigmaPx, and $_{Vz}$ is SigmaVz, in ECEF Cartesian coordinates. Format: same as CorPxVx If the code for no statement is entered, CorPxVz = 0.0 will be assumed.		
44	CorPyVx	12 N	Required if available	Correlation of Y position and X velocity, calculated as unitless Cov(Py,Vx)/($_{Py}$ $_{Vs}$), where Cov(Py,Vx) is the error covariance matrix element for covariance of Y position with X velocity, $_{Py}$ is SigmaPy, and $_{Vx}$ is SigmaVx, in ECEF Cartesian coordinates. Format: same as CorPxVx If the code for no statement is entered, CorPyVx = 0.0 will be assumed.		

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
45	CorPyVz	12 N	Required if available	Correlation of Y position and Z velocity, calculated as unitless Cov(Py,Vz)/($_{Py}$ $_{Vz}$), where Cov(Py,Vz) is the error covariance matrix element for covariance of Y position with Z velocity, $_{Py}$ is SigmaPy, and $_{Vz}$ is SigmaVz, in ECEF Cartesian coordinates. Format: same as CorPxVx If the code for no statement is entered, CorPyVz = 0.0 will be assumed.		
46	CorPzVx	12 N	Required if available	Correlation of Z position and X velocity, calculated as unitless Cov(Pz,Vx)/($_{Pz}$ $_{Vs}$), where Cov(Pz,Vx) is the error covariance matrix element for covariance of Z position with X velocity, $_{Pz}$ is SigmaPz, and $_{Vx}$ is SigmaVx, in ECEF Cartesian coordinates. Format: same as CorPxVx If the code for no statement is entered, CorPzVx = 0.0 will be assumed.		
47	CorPzVy	12 N	Required if available	Correlation of Z position and Y velocity, calculated as unitless Cov(Pz,Vy)/($_{Pz}$ $_{Vy}$), where Cov(Pz,Vy) is the error covariance matrix element for covariance of Z position with Y velocity, $_{Pz}$ is SigmaPz, and $_{Vy}$ is SigmaVy, in ECEF Cartesian coordinates. Format: same as CorPxVx If the code for no statement is entered, CorPzVy = 0.0 will be assumed.		
48	Missile_Type	4 N	Required	Perceived most probable type of (parent) ballistic missile for this track: 0000 = No statement 0001 through 4095 per MIL-STD-6016B, Space Specific Type data item, DFI 749		J3.6I Space Specific Type
49	Conf_Missile_Type	6 N	Required	Perceived probability that the ballistic missile of the type identified by the Missile_Type value code above is the true (parent) ballistic missile for this track: Format: 0.7562 No statement is 9.9999		
50	Have_MlsType_Vec	1 A	Required	Indicator that a full missile typing probability vector is recorded for this track (Y = Yes, N = No)		
51	Prob_WH	N 6	Required	Perceived probability that an object with a warhead is contained in this track: Format: 0.7562 No statement is 9.9999		
52	Prob_RM	N 6	Required	Perceived probability that an object with a rocket motor, but no		

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
				warhead, is contained in this track: Format: 0.1562 No statement is 9.9999 Note: Except for "no statement" entries, it should be true that (1 - Prob_WH - Prob_RM) is the perceived probability this track contains no object with a warhead or a rocket motor.		
53	Have_ObjClass_Vec	1 A	Required	Indicator that a full object classification probability vector is recorded for this track (Y = Yes, N = No)		
54	LPE_Rpt_Assoc	18 A	Required	Alpha-numeric string that by itself or in concatenation with the Net_Source data item value uniquely names the most recent launch point estimate (if any) that is associated with this track. If this track is a remote track, enter the reference point (track) number of the last launch point estimate report for the track. If this track is not remote, enter the local unique designation/number of the last launch point estimate mapped to this track. Examples: NONE, L16#1A001 Note: If more than one object is reportable and the track in this record is a remote track, the unit from which this track record is extracted will not necessarily be able to map an LPE reference point to this track record. For local tracks and LPEs, on the other had, a particular LPE reference point may map to more than one local track.		J3.0I Track Number, Reference
55	IPP_Rpt_Assoc	18 A	Required	Alpha-numeric string that by itself or in concatenation with the Net_Source data item value uniquely names the most recent impact point prediction (if any) that is associated with this track. If this track is a remote track, enter the reference point (track) number of the last impact point prediction report. If this track is not remote, enter the local unique designation/number of the last impact point prediction associated with this track. Example: NONE, L16#1A002 Note: If an IPP has been reported or locally generated for this track, the mapping to this track should be known.		J3.0I Track Number, Reference
56	Is_Reporting	10 A	Required	A vector of the tactical data system's perceptions of whether it should be and is reporting this track on the tactical data links corresponding to the indices of the vector data item. The first index corresponds to Link-16; the second index corresponds to TIBS; other indices are currently reserved. Format: YYNNNNNNNN, YNNNNNNNNN Note: If the track in this record is a remote track, the proper response is "NNNNNNNNNN".		
57	Is_Mutual	10 A	Required	A vector of the tactical data system's perception of whether the		

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
				local track reported in this record correlates (is mutual) with a (primary, e.g., R2) network track on the tactical data links corresponding to the indices of the vector. The first index corresponds to Link-16; the second index corresponds to TIBS; other indices are currently reserved. Format: NNNNNNNNNN, NYNNNNNNNN Note: If the track in this record is a remote track, the proper response is "NNNNNNNNNN".		
58	Scored_Nets	10 A	Required	A vector identifying, in order, the networks employed (or modeled) in this venue for which the next five fields contain network track numbers. The first index corresponds to Link-16; the second index corresponds to TIBS; other indices are currently reserved. Format: YYNNNNNNNN, NYNNNNNNNN A "Y" entry should be entered if commonality attribute measure(s), correlation performance MOP(s), or other measure(s) that reference a (primary) network track number are to be scored for this network. Up to 5 indices may contain a "Y".		
59	Net_Trk_1st_Net	18 A	Required	For the first network indicated by a "Y" in the Scored_Nets data item, the alpha-numeric string identification of the network track to which the track in this record is associated/correlated. If the track in this record is a remote-only track considered to be the (primary) network track, then enter the same string as the Trk_Number data item. If the track in this record is a local track and is being reported as the (primary) network track, then enter a concatenation of the network abbreviation and the alpha-numeric string track number used when reporting this track, i.e., the same format as the remote-only track case. If the track in this record is a local track and is correlated to a (primary) network track, then enter the a concatenation of the network abbreviation and the alpha-numeric string track number of the (primary) network track to which it is correlated, i.e., the same format as the remote-only track case. Otherwise, enter "NONE". Examples: L16#0A001, NONE		
60	Net_Trk_2nd_Net	18 A	Required	For the second network indicated by a "Y" in the Scored_Nets data item, the alpha-numeric string identification of the network track to which the track in this record is associated/correlated. The type of content and the format is the same as for Net_Trk_1st_Net.		
61	Net_Trk_3rd_Net	18 A	Required	For the third network indicated by a "Y" in the Scored_Nets data item, the alpha-numeric string identification of the network track to which the track in this record is associated/correlated. The		

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
				type of content and the format is the same as for Net_Trk_1st_Net.		
62	Net_Trk_4th_Net	18 A	Required	For the fourth network indicated by a "Y" in the Scored_Nets data item, the alpha-numeric string identification of the network track to which the track in this record is associated/correlated. The type of content and the format is the same as for Net_Trk_1st_Net.		
63	Net_Trk_5th_Net	18 A	Required	For the fifth network indicated by a "Y" in the Scored_Nets data item, the alpha-numeric string identification of the network track to which the track in this record is associated/correlated. The type of content and the format is the same as for Net_Trk_1st_Net.		
64	Truth_Obj_Match	18 A	Optional	Designator used to describe uniquely the truth object to which the track in this record has been assigned by a tracks-to-truth assignment: Example: n0001t401056c002		
65	Remote_Mutual_TQ	20 N	Optional	Vector of two digits integers corresponding to the reported track quality number of the remote mutual tracks for which there are "Y" entries indicted in the Is_Mutual data item vector in this record. Use "99" for all places in which there is an "N" in the Is_Mutual data item vector. Use "88" for places in which there is a "Y" in the Is_Mutual data item vector, but the remote track quality number is not known. Format example: 99139999999999999999		
66	Live/Sim_Indicator	9 A	Optional	Indication whether the record is for a live event (live targets, real software), a simulation stimulation of software in the loop (e.g., JDEP), or pure simulation. Examples: LIVE-SWIL, SIM-SWIL, SIM-SIM		
67	IU_Designator	18 A	Optional	Alpha-numeric string concatenation of an abbreviation of a network in which this platform participates, along with its interface unit number assigned to that network Example: L16#00075		
68	System_Variant	3 N	Optional	System variant 000 Reserved 001 = Aegis BL 2.10 002 = Aegis BL 5.0 003 - 019 Reserved for other Aegis 020 Reserved 021 = PATRIOT ICC 022 = PATRIOT ECS 023 - 039 Reserved for other PATRIOT		

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
				040 Reserved 041 - 999 To be determined		
69	HDR_XT	11 N	Optional	Extraction time, in milliseconds (to three decimals) past Zulu midnight. Format: 6821350.743		
70	Platform_Lat	Floating Point Number	Optional	WGS-84 latitude that should be used for ENU to/from ECEF coordinate transformation for the platform from which this track is extracted, in degrees. Format: 35.688612 Positive for North / Negative for South		
71	Platform_Long	Floating Point Number	Optional	WGS-84 longitude that should be used for ENU to/from ECEF coordinate transformation for the platform from which the track is extracted, in degrees. Format: 128.362791 Positive for East / Negative for West		
72	Platform_Alt	Floating Point Number	Optional	WGS-84 altitude that should be used for ENU to/from ECEF coordinate transformation for the platform from which the track is extracted, in meters. Format: 11690.1 Positive is above the ellipsoid (Note: This is not altitude above mean sea level.)		
73	Unit_Name	20 A	Optional	Unit name. Format: Free form alpha numeric name.		
74	Unit_No	7 A	Optional	Unit Number Example: Hull Number, Side Number, Event Number		
75	Unit_Type	10 A	Optional	Unit Type. Example: CG		
76	Scenario_Ref	10 A	Optional	Raid name/number, vignette name/number, etc. Example: Event 2		

Notes: 1. Displayed in Status Box. Field Size: A = AlphanumericN = Numeric
2. All fields are to be comma delimited.

Ballistic Missile Launch Point Estimate (LPE) and Impact Point Prediction IPP Record

The data format for computing the LPE and IPP for ballistic missiles is provided in Table B-4.

Table B-4 LPE and IPP Format for Ballistic Missiles

File Name: May be customized for each venue
Line 1 (required): Venue/event and unit name from which data is extracted (example: RS03_BMD_Event1, PAC_ICC#2)
Line 2 (required): Number of lines N of optional static header information
Lines 3 through N+2 (optional): Static header information in unspecified format.
Line N+3: Start format below

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
1	Record_Type	1 A	Required	Code indicating record type: 1 = Air track or air vehicle truth object data 2 = BM track or BM truth object data 3 = BM LPE or IPP or truth launch or impact data 0 and 4 - 9 Reserved A - Z = Custom record type whose format, content, and meaning is somehow indicated on lines 3 through N+2.		
2	Intended_Treatment	1 N	Required	Code for how the record is to be treated: 0 = Record is truth data 1 = Record is LPE or IPP data to be scored in metrics 2 = Record is other LPE or IPP data (for root cause analysis)		
3	Type_Ref_Pt	3 A	Required	Identifies this record as an LPE or as an IPP Examples: LPE, IPP	J3.0 Pt Type + Pt Amp	1
4	Point_Number	18 A	Required	Alpha-numeric string that by itself or in concatenation with the file Line 1 uniquely names this LPE or IPP reference point at the indicated valid time and that is intended to be kept at least until perceived impact of the last reportable object from this missile.	J3.0I Track Number, Reference	1

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
				Examples: L16#0A002, n0001t401100, n0001t401004		
5	Net_Source	5 A	Required	Network source of the LPE or IPP position/time data in this record Examples: LOCAL, L16, TIBS, CEC, TRUTH		1
6	LPE/IPP_Source	7 A	Required	Alpha-numeric string that by itself or in concatenation with the Net_Source data item value uniquely names the source for this LPE or IPP. If this is LPE or IPP is remotely generated, enter the network interface unit (track) number of the source of the LPE or IPP data. If this LPE or IPP is locally generated, enter a string for the local sensor that served as the (primary) source of data. Examples: L16#00076, LOC_59, CEC_SPY, LOC_FU1,		1
7	Time_Ref	7 A	Required	Time reference for the Gen_Date, Gen_Hrs&Min, Gen_Sec, Est_Time_Date, Est_Time_Hrs&Min, and Est_Time_Sec data item values in this record. Examples: UTC, GPS, L16_NTR		
8	Gen_Date	8 N	Required	Zulu date part of the time of generation (or receipt) the data in this record. Format: YYYYMMDD YYYY = Year, MM = Month, DD = Day Example: 20030326 = March 26, 2003 Must be 8 digits		
9	Gen_Hrs&Min	4 N	Required	Zulu hours and minutes part of the time of generation (or receipt) the data in this record Format: HHMM HH = Hours, MM = Minutes Example: 1754 Must be 4 digits		
10	Gen_Sec	9 N	Required	Seconds part of the time of generation (or receipt) the data in this record. Format: 39.572135 Precision or this data item must be sufficient to guarantee that this LPE or IPP record is a unique version.		
11	Est_Time_Date	8 N	Required	Zulu date part of the estimate of launch or impact time. Format: Same as Gen_Date		
12	Est_Time_Hrs&Min	4 N	Required	Zulu hours and minutes part of the estimate of launch or impact time. Format: Same as Gen_Hrs&Min		J3.0I Hour and minute for HH

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
						and MM
13	Est_Time_Sec	6 N	Required	Seconds part of the estimate of launch or impact time. Format: 39.510 Truth data should have one millisecond precision. LPE or IPP data should have maximum available precision down to one millisecond.		J3.0C5 Second
14	Pt_Lat	10 N	Required	WGS-84 latitude of the launch or impact point estimate, in degrees. Format: 35.688612 Positive for North / Negative for South Full precision is desired for truth data.		J3.0E0 Latitude
15	Pt_Long	11 N	Required	WGS-84 longitude of launch or impact point estimate, in degrees. Format: 128.362791 Positive for East / Negative for West Full precision is desired for truth data.		J3.0E0 Longi-tude
16	Pt_Altitude	7 N	Optional	WGS-84 altitude of launch or impact point estimate, in meters. Format: 1165.2 Positive for above the ellipsoid, negative for below. Note: LPE and IPP altitude estimates are not scored directly in the SIAP attribute measures.		J3.0E0 Altitude, correcte d from MSL to WGS-84
17	SigmaT	6 N	Required if available	Standard deviation or RMS error of the Est_Time_Sec data item value for this record, in units of seconds. Format: 12.06 -99.99 for no statement		
18	Major_Axis_95th	11 N	Required	Dimension of the major axis of the 95th percentile uncertainty area ellipse, in meters. Format: 1046659.3 -999999.9 for no statement	J3.0E5 Area Major Axis	
19	Minor_Axis_95th	11 N	Required	Dimension of the minor axis of the 95th percentile uncertainty area ellipse, in meters. Format: same as 95th_Major_Axis	J3.0E5 Area Minor Axis	
20	Axis_Orientation	6 N	Required	Azimuth angle of the orientation of the 95th percentile major axis, measured clockwise from north, in degrees. Format: 162.3 -999.9 for no statement	J3.0E5 Axis Orienta-tion	
21	Missile_Type	4 N	Required for LPE	Perceived most probable type of ballistic missile for this LPE: 0000 = No statement		J3.6I Space

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
				0001 through 4095 per MIL-STD-6016B, Space Specific Type data item, DFI 749		Specific Type
22	Conf_Missile_Type	6 N	Required for LPE	Perceived probability that the ballistic missile of the type identified by the Missile_Type value code above is the true ballistic missile type for this LPE: Format: 0.7562 No statement is 9.9999		
23	Have_MlsType_Vec	1 A	Required for LPE	Indicator that a full missile typing probability vector is recorded for this LPE (Y = Yes, N = No)		
24	Prob_WH	N 6	Required for IPP	Perceived probability that this IPP is for an object with a warhead: Format: 0.7562 No statement is 9.9999		
25	Prob_RM	N 6	Required for IPP	Perceived probability that this IPP is for an object with a rocket motor, but with no warhead: Format: 0.1562 No statement is 9.9999 Note: Except for "no statement" entries, it should be true that (1 - Prob_WH - Prob_RM) is the perceived probability this IPP for an object without a warhead or a rocket motor.		
26	Have_ObjClass_Vec	1 A	Required for IPP	Indicator that a full object classification probability vector is recorded for this IPP (Y = Yes, N = No)		
27	Trk_Assoc	18 A	Required	Alpha-numeric string that by itself or in concatenation with the Net_Source data item value uniquely names the (primary) track or, if truth data, the truth object to which this point/time estimate is associated. If this LPE or IPP is generated remotely, enter an abbreviation of the network concatenated with the track number of the network track to which this LPE or IPP is associated If this LPE or IPP is not remote, enter the local track number to which this LPE or IPP is associated. If this record is truth data, the entry will usually be the same as for the Point_Number data item value. Examples: CTSL1003, L16#0A001, n0001t401004		J3.0C5 Track Number, Related
28	Is_Reporting	10 A	Required	A vector of the tactical data system's perceptions of whether it should be and is reporting this LPE or IPP on the tactical data links corresponding to the indices of the vector data item. The first index corresponds to Link-16; the second index corresponds to TIBS; other indices are currently reserved. Format: YYNNNNNNNN, YNNNNNNNNN		
29	Is_Mutual	10 A	Optional	A vector of the tactical data system's perception of whether the LPE or IPP in this record correlates (is mutual) with a network		

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
				LPE or IPP on the tactical data links corresponding to the indices of the vector. The first index corresponds to Link-16; the second index corresponds to TIBS; other indices are currently reserved. Format: NNNNNNNNNN, NYNNNNNNNN		
30	Scored_Nets	10 A	Required	A vector identifying, in order, the networks employed (or modeled) in this venue for which the next five fields contain network LPE or IPP reference point numbers. The first index corresponds to Link-16; the second index corresponds to TIBS; other indices are currently reserved. Format: YYNNNNNNNN, NYNNNNNNNN A "Y" entry should be entered if commonality attribute measure(s), correlation performance MOP(s), or other measure(s) that reference a (primary) network LPE or IPP reference point number are to be scored for this network. Up to 5 indices may contain a "Y".		
31	Net_Pt_1st_Net	18 A	Required	For the first network indicated by a "Y" in the Scored_Nets data item, the alpha-numeric string identification of the network reference point to which the LPE or IPP in this record is associated/correlated. If the LPE or IPP in this record is a remote-only data considered to be the (primary) network LPE or IPP, then enter the same string as the Point_Number data item. If the LPE or IPP in this record is generated from local data and is being reported as the (primary) network LPE or IPP, then enter a concatenation of the network abbreviation and the alpha-numeric string reference point number used when reporting this LPE or IPP, i.e., the same format as the remote-only data case. If the LPE or IPP in this record is generated from local data and is correlated to a (primary) network LPE or IPP, then enter the a concatenation of the network abbreviation and the alpha-numeric string reference point number of the (primary) network LPE or IPP to which it is correlated, i.e., the same format as the remote-only data case. Otherwise, enter "NONE". Examples: L16#0A002, NONE		
32	Net_Pt_2nd_Net	18 A	Required	For the second network indicated by a "Y" in the Scored_Nets data item, the alpha-numeric string identification of the network LPE or IPP reference point to which the LPE or IPP in this record is associated/correlated. The type of content and the format is the same as for Net_Pt_1st_Net.		
33	Net_Pt_3rd_Net	18 A	Required	For the third network indicated by a "Y" in the Scored_Nets data item, the alpha-numeric string identification of the network LPE or IPP reference point to which the LPE or IPP in this record is associated/correlated. The type of content and the format is the		

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
				same as for Net_Pt_1st_Net.		
34	Net_Pt_4th_Net	18 A	Required	For the fourth network indicated by a "Y" in the Scored_Nets data item, the alpha-numeric string identification of the network LPE or IPP reference point to which the LPE or IPP in this record is associated/correlated. The type of content and the format is the same as for Net_Pt_1st_Net.		
35	Net_Pt_5th_Net	18 A	Required	For the fifth network indicated by a "Y" in the Scored_Nets data item, the alpha-numeric string identification of the network LPE or IPP reference point to which the LPE or IPP in this record is associated/correlated. The type of content and the format is the same as for Net_Pt_1st_Net.		
36	Truth_Pt_Match	18 A	Optional	Designator used to describe uniquely true launch or true impact point to which the LPE or IPP in this record has been assigned, respectively, by a LPE-to-truth or an IPP-to-truth assignment. The true launch and true impact points are uniquely labeled by the initial launch stack truth object and by the impacting truth object: Example: n0001t401100, n0001t401004		
37	Live/Sim_Indicator	9 A	Optional	Indication whether the record is for a live event (live targets, real software), a simulation stimulation of software in the loop (e.g., JDEP), or pure simulation. Examples: LIVE-SWIL, SIM-SWIL, SIM-SIM		
38	IU_Designator	18 A	Optional	Alpha-numeric string concatenation of an abbreviation of a network in which this platform participates, along with its interface unit number assigned to that network Example: L16#00075		
39	System_Variant	3 N	Optional	System variant 000 Reserved 001 = Aegis BL 2.10 002 = Aegis BL 5.0 003 - 019 Reserved for other Aegis 020 Reserved 021 = PATRIOT ICC 022 = PATRIOT ECS 023 - 039 Reserved for other PATRIOT 040 Reserved 041 - 999 To be determined		
40	HDR_XT	11 N	Optional	Extraction time, in milliseconds (to three decimals) past Zulu midnight. Format: 6821350.743		
41	Platform_Lat	Floatin	Optional	WGS-84 latitude that should be used for ENU to/from ECEF		

Field #	Variable	Field Size	Required or Optional	Definition	Link-16 Example	Notes
		g Point Numb er		coordinate transformation for the platform from which this LPE or IPP is extracted, in degrees. Format: 35.688612 Positive for North / Negative for South		
42	Platform_Long	Floatin g Point Numb er	Optional	WGS-84 longitude that should be used for ENU to/from ECEF coordinate transformation for the platform from which the LPE or IPP is extracted, in degrees. Format: 128.362791 Positive for East / Negative for West		
43	Platform_Alt	Floatin g Point Numb er	Optional	WGS-84 altitude that should be used for ENU to/from ECEF coordinate transformation for the platform from which the LPE or IPP is extracted, in meters. Format: 11690.069 Positive is above the ellipsoid (Note: This is not altitude above mean sea level.)		
44	Unit_Name	20 A	Optional	Unit name. Format: Free form alpha numeric name.		
45	Unit_No	7 A	Optional	Unit Number Example: Hull Number, Side Number, Event Number		
46	Unit_Type	10 A	Optional	Unit Type. Example: CG		
45	Scenario_Ref	10 A	Optional	Raid name/number, vignette name/number, etc. Example: Event 2		

Notes: 1. Displayed in Status Box. Field Size: A = AlphanumericN = Numeric
2. All fields are to be comma delimited.

APPENDIX C: Sample Forms

Test Observation Report

Roving Sands 2003 Test Observation Report (TOR)		
Classification: (circle one) UNCLAS CONF SECRET	**System(s) TOR is written against:**	**TOR Number:** **Operator Position:** **Reported by:** **Phone #:** **Email:**
Date of event:	**Time:** Zulu Time: Or Local Time:	**Tape Numbers:**
Description:		
Impact: (optional)		

TOR Instructions	
Classification	Security classification of the TOR.
System	Aircraft, ship, or land based site (TAOC, CRC, ICC, DDG, etc.) affected by observed anomaly.
TOR number	TOR number (to be assigned when entered into tracking table or database)
Operator Position	Watch/test station where the observation was made.
Reported by	Originator of the TOR and command.
Phone Number	Phone number originator can be reached at after event.
Tape Numbers	Complete tape number for the DX tape to use for analysis (include system, if known).
Date of event	Date of observation (MMDD).
Time	Time of observation. Designate either Zulu or Local Time.
Description	A thorough description of the observation. Should include system name and configuration, scenario information, tracks, identifications, track kinematics, and other information necessary to establish the same environment as the observation. Also include information as to what actually happened during

	the observation.
Impact	A brief description of the operator impacts this deficiency had on the operator or system if not corrected.

Formal Analysis Report (FAR)

CLASSIFICATION		
Roving Sands 2003 Final Analysis Report (FAR)		
TOR #:	**FAR Date:**	**FAR Revision #:**
Short Title:		
Date of event:	**Analyst Name:**	
Time of event:	**Phone:**	
System(s)/IU #:	**E-mail:**	
Program Version:	**Analysis Hours:**	
Tapes/Files:		
Status: **Open** o **Closed** o	**Further Analysis Required?** **Yes** o **No** o	**Test Objective Required?** **Yes** o **No** o
Functional Area:		**TTP Issue?** **Yes** o **No** o
Problem Summary:		
ANALYSIS DETAIL **Detailed Sequence of Events (Actions, times, results, etc.):**		
Analysis Conclusion:		
Proposed Operation Workaround:		
Operational Impact:		

FAR Instructions

Classification: Security classification of the FAR.
TOR#: Represents the TOR number assigned by the originating organization

FAR Date: FAR creation date.

FAR Revision #: Represents the number of analysis efforts against the TOR.

Short Title: A very brief description of the observation from the referenced TOR.

Date of Event: Date observation was made.

Time of Event: Time observation was made.

System(s)/IU #: Specific system(s) affected.

Program Version: Represents the combat system version for the unit/aircraft that originated the deficiency.

Tapes/Files: Data files used during the analysis process.

Analyst Name: Person analyzing the deficiency.

Phone: Analyst phone number.

E-mail: Analyst e-mail address.

Analysis Hours: Hours expended in the analysis of the deficiency.

Status: Open or Closed

Further Analysis Required?: Yes or No

Test Objective Required? : Yes or No
Functional Area: As identified by Table 6

TTP Issue: Yes or No

Problem Summary: A thorough description of the observation. This information should include what actually happened during the observation.

Detailed Sequence of Events: Detailed description of the events that occurred to cause the deficiency.

Analysis Conclusions: Conclusions from the analysis effort to determine if the deficiency is valid or if it should be closed.

Proposed Operation Workaround: A brief description of what could be done to work around the deficiency.

Operational Impact: A brief description of the operational impact this deficiency will have on the operator/system if not corrected.

APPENDIX D: Points of Contact

Tables D-1 and D-2 list the core members responsible for planning and executing the SIAP analysis efforts documented in this plan. The team will work closely with the RS 03 Joint Assessment Group that has overall RS 03 data collection responsibility.

Table D-1. ROVING SANDS 2003 Points of Contact: Organizational

Name	Organization	Role	Telephone Number (COMM) (DSN)	E-mail (UNCLASSIFIED) (SIPRNET)
Jeff Heckel	SIAP SE TF	Lead	(703) 602-6441	Heckeljj@NAVSEA.NAVY.MIL
Maj. Dave Chelen	SIAP SE TF	Lead assistant	(703) 602-6441 x252	ChelenDE@NAVSEA.NAVY.MIL
Mr. Darrell Schultz	SIAP SE TF	SAT	(703) 602-6441 X228	SchultzDP@NAVSEA.NAVY.MIL
Eric Byrd	SIAP SE TF	MSEL, CRS	(703) 602-6441	Byrdel@navsea.navy.mil
Betty Youmans	SIAP SE TF/SPA	Test plan preparation	(703) 578-5696	eyoumans@spa.com
Dan Busch	SIAP SE TF/WBB	Data requirements, MOAs	(703) 448-6081 x182	Dbusch@wbbinc.com
Dan Bergstrom	NSWC Corona	PET	(909) 273-5084	BergstromDJ@corona.navy.mil

Table D-2 Points of Contact: Assessment Teams

Name	Organization	Assessment	Telephone Number (COMM) (DSN)	E-mail (UNCLASSIFIED) (SIPRNET)
Jeff Heckel	SIAP SE TF	TBM	(703) 602-6441	Heckeljj@NAVSEA.NAVY.MIL
Dan Bergstrom	NSWC Corona	TBM	(909) 273-5084	BergstromDJ@corona.navy.mil
Erik Van Fleet	NSWC Corona	TBM	(909) 273-4155	VanFleetET@corona.navy.mil
Maj Dave Borowsky	SIAP SE TF	M&S	(703) 602-6441	BorowskyDJ@NAVSEA.NAVY.MIL
Mr. Jerry Darnell	SIAP SE TF	T/F	(703) 602-6441 x223	darnelljm@navsea.navy.mil
Mr. Jason Long	RNB Technologies	T/F	(540) 658-1215 x1003	jason.long@RNBTechnologies.com
Tom Cole	JITC	T/F	(520) 533-5421	colet@fhu.disa.mil